

CLAIMS

1. A process for producing an ester, comprising reacting a carboxylic acid and ethylene in the presence of an acid catalyst in a vapor phase, wherein the concentration of olefin having 3 or more carbon atoms in the starting materials is 10,000 ppm or less in terms of the molar ratio to the total of the olefin and ethylene.

2. The process as claimed in claim 1, wherein the concentration of olefin having 3 or more carbon atoms in the starting materials is 5,000 ppm or less in terms of the molar ratio to the total of the olefin and ethylene.

3. The process as claimed in claim 2, wherein the concentration of olefin having 3 or more carbon atoms in the starting materials is 1,000 ppm or less in terms of the molar ratio to the total of the olefin and ethylene.

4. The process as claimed in any one of claims 1 to 3, wherein the olefin having 3 or more carbon atoms comprises at least one compound selected from the group consisting of trans-2-butene, cis-2-butene and 1-butene.

5. A process for producing an ester, comprising reacting a carboxylic acid and ethylene in the presence of an acid catalyst in a vapor phase, wherein the concentration of olefin equivalent in the starting materials is 50,000 ppm or less in terms of the molar ratio to the total of the olefin equivalent and ethylene.

6. The process as claimed in claim 5, wherein the concentration of olefin equivalent in the starting materials is 25,000 ppm or less in terms of the molar ratio to the total of the olefin equivalent and ethylene.

7. The process as claimed in claim 6, wherein the concentration of olefin equivalent in the starting materials is 5,000 ppm or less in terms of the molar ratio to the total of the olefin equivalent and the ethylene.

8. The process as claimed in any one of claims 5 to 7, wherein the olefin equivalent comprises at least one compound selected from the group consisting of

saturated alcohols having 3 or more carbon atoms, esters of a carboxylic acid and a saturated alcohol having 3 or more carbon atoms, and saturated ethers having 5 or more carbon atoms.

9. A process for producing an ester, comprising reacting a carboxylic acid and ethylene in the presence of an acid catalyst in a vapor phase, wherein the sum of the concentration of olefin having 3 or more carbon atoms and one-fifth the concentration of olefin equivalent in the starting materials is 10,000 ppm or less in terms of the molar ratio to the total of the olefin and olefin equivalent and ethylene.

10. The process as claimed in claim 9, wherein the sum of the concentration of olefin having 3 or more carbon atoms and one-fifth the concentration of olefin equivalent in the starting materials is 5,000 ppm or less in terms of the molar ratio to the total of the olefin and olefin equivalent and ethylene.

11. The process as claimed claim 10, wherein the sum of the concentration of olefin having 3 or more carbon atoms and one-fifth the concentration of olefin equivalent in the starting materials is 1,000 ppm or less in terms of the molar ratio to the total of the olefin and olefin equivalent and ethylene.

12. The process as claimed in any one of claims 9 to 11, wherein the olefin having 3 or more carbon atoms comprises at least one compound selected from the group consisting of ~~trans~~-2-butene, cis-2-butene and 1-butene.

13. The process as claimed in any one of claims 9 to 12, wherein the olefin equivalent comprises at least one compound selected from the group consisting of saturated alcohols having 3 or more carbon atoms, esters of a carboxylic acid and a saturated alcohol having 3 or more carbon atoms, and saturated ethers having 5 or more carbon atoms.

14. The process as claimed in any one of claims 1 to 13, wherein the carboxylic acid and ethylene is

reacted in the presence of water.

15. The process as claimed in any one of claims 1 to 14, wherein the carboxylic acid is at least one of lower aliphatic carboxylic acids having from 1 to 4 carbon atoms.

16. The process as claimed in any one of claims 1 to 15, wherein the acid catalyst comprises at least one compound selected from heteropolyacids and heteropolyacid salts.

17. The process as claimed in claim 16, wherein the heteropolyacid comprises at least one compound selected from the group consisting of silicotungstic acid, phosphotungstic acid, phosphomolybdic acid, silicomolybdic acid, silicovanadotungstic acid, phosphovanadotungstic acid, phosphovanadomolybdic acid, molybdotungstosilicic acid and molybdotungstophosphoric acid.

18. The process as claimed in claim 16, wherein the heteropolyacid salt comprises at least one compound selected from the group consisting of lithium, sodium, potassium, cesium, magnesium, barium, copper, gold, gallium and ammonium salts of heteropolyacids.

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